COURSE PLAN

Name of the Course Instructor: T.Vinothini, AP/CSE — Class: IV Year

Course Code & Name: OME753 System Engineering — Semester: VII

VISION of SSCE	**MISSION of SSCE**
To strive continuously for excellence in education, research, technology and interdisciplinary collaboration to meet the changing needs of the society.	To develop high quality technical education through research and innovation by adapting the students to changing technological environment with the highest ethical values.

Department of Computer Science Engineering

DEPARTMENT VISION	DEPARTMENT MISSION
To Strive continuously for improvement of rural students in the area of Computer Science and Engineering through academic and self-learning to meet the changing needs of society with ethical values.	• To acquire knowledge in the area of mathematics, software Engineering, Hardware,Programming language and Algorithms to become expertise in Computer Science and Engineering. • To apply the knowledge of computer science engineering to solve real world problems for amplifying their potential for lifelong high-quality career and give them a competitive advancement in the ever-changing work environment. • To empower the students as an Engineer with the required skills to solve the complex technological problems of modern society and also provide them with framework for promoting collaborative and multidisciplinary activities. • To ensure communication skills, self-learning, interaction with the industry and academia through internship and industrial visit for the widespread of job opportunities inGovernment and Private sector.

Programme Educational Objectives (PEOs)

The Program Educational Objectives of the computer science Engineering Degree Program are to impart Knowledge, Skill and Attitude on the graduates to:

PEO-1	Imparting Knowledge	To provide students with a strong foundation in mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyze computer science engineering problems.
PEO-2	Multi-discipline	To develop the ability among students to understand, analyze, design and apply current pedagogical techniques, industry accepted computing practice and state-of-art technology.
PEO-3	Research Skill	To provide opportunities to students to broaden their educational experiences for the changing requirements of the industry through strong communication, leadership, and entrepreneurial skills along with self-learning.
PEO-4	Managerial Skill	To encourage the students in research and inquiry leading to innovations and appropriately apply knowledge of societal impacts of computing technology with ethical and professional responsibilities of their work.
PEO-5	Life-long learning	To prepare graduates to be successfully employed in the right role and achieve career succession in industry / R&D organization, to take up higher education programs and to pursuit lifelong learning.

Programme Outcomes (POs)

The Programme Outcomes of the B.E.Computer Science Engineering program

PO-1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO-2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences

PO-3	Design/development of solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO-4	Conduct investigations of complex problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO-5	Modern tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO-6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO-7	Environment and sustainability:	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO-8	Ethics:	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO-9	Individual and team work:	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO-10	Communication:	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations.
PO-11	Project management and finance:	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one‘s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO-12	Life-long learning:	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes (PSOs)

The graduates of Bachelor of Engineering in Computer Science Engineering program will be able to:

PSO-1	Basic Engineering Knowledge	To analyze, design and develop computing solutions by applying foundational concepts of Computer Science and Engineering.
PSO-2	Managerial Skill	To apply software engineering principles and practices for developing quality software for scientific and business applications.
PSO-3	Research Skill	To apply software engineering principles and practices for developing quality software for scientific and business applications.

SYLLABUS

SUBJECT CODE:OME 753 **YEAR:IV CSE**

SUB NAME:SYSTEM ENGINEERING **SEMESTER:VII**

UNIT I INTRODUCTION 9

Definitions of Systems Engineering, Systems Engineering Knowledge, Life cycles, Life-cycle phases, logical steps of systems engineering, Frame works for systems engineering.

UNIT II SYSTEMS ENGINEERING PROCESSES 9

Formulation of issues with a case study, Value system design, Functional analysis, Business Process Reengineering, Quality function deployment, System synthesis, Approaches for generation of alternatives.

UNIT III ANALYSIS OF ALTERNATIVES- I 9

Cross-impact analysis, Structural modeling tools, System Dynamics models with case studies, Economic models: present value analysis – NPV, Benefits and costs over time, ROI, IRR; Work and Cost breakdown structure

UNIT IV ANALYSIS OF ALTERNATIVES–II 9

Reliability, Availability, Maintainability, and Supportability models; Stochastic networks and Markov models, Queuing network optimization, Time series and Regression models, Evaluation of large scale models

UNIT V DECISION ASSESSMENT 9

Decision assessment types, Five types of decision assessment efforts, Utility theory, Group decision making and Voting approaches, Social welfare function; Systems Engineering methods for Systems Engineering Management,

TEXT BOOK:

1. Andrew P. Sage, James E. Armstrong Jr. “Introduction to Systems Engineering”, John Wiley and Sons, Inc, 2000.

TOTAL :45

CORRELATION LEVEL MATRIX

COs	POs											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2											1
CO2		3										
CO3			3									
CO4				2					1			
CO5			2						1	0		

COURSE OUTCOMES (COs)

COURSE OUTCOMES (COS)		SKILL	PO	BT LEVEL	ASSESSMENT TOOLS
CO1	Articulate the main concepts, key technologies, strengths and limitations of system engineering	Understand/Remember	PO12	L1/L2	IAT, CT
CO2	Make use of life cycle phases architecture to solve architecture design challenges	Apply	PO1	L2	IAT, CT
CO3	Explain the core issues of system engineering such as resource management and security	Analyze	PO2	L3	IAT, CT
CO4	Install and use current technologies of engineering field.	Evaluate	PO4,PO9	L4	Assignment
CO5	Illustrate and choose the appropriate technologies, algorithms and approaches for implementation and use of requirements to fulfill the customer needs.	Create	PO3,PO9	L5	Case study

LESSON PLAN

SREE SOWDAMBIKA COLLEGE OF ENGINEERING
Department of Computer Science and Engineering

SUBJECT CODE:OME 753 **YEAR:IV CSE**
SUB NAME:SYSTEM ENGINEERING **SEMESTER:VII**

Topic No.	Topic Name	Text / Reference Book		Course Outcome	Mode of Teaching & ICT Tools
		Chapter No.	Page No.		
	UNIT II - SYSTEMS ENGINEERING PROCESSES				
10	Problem or Issue Identification	T1-3	97-104	CO2	PPT
11	Value system design	T1-3	104-113	CO2	BB
12	Formulation of issues with example	T1-3	113-124	CO2	BB
13	System synthesis	T1-3	124-127	CO2	**Reciprocal Teaching**
14	Functional analysis	T1-3	127-139	CO2	BB
15	Quality function deployment	T1-3	139-141	CO2	BB
16	Business Process Reengineering	W1	W1	CO2	PPT
17	Approaches for generation of alternatives-Brainstroming,Groupware	T1-3	148-160	CO2	PPT
18	Approaches for generation of alternatives-Delphi method,Moropological Box	T1-3	160-167	CO2	BB

Topic No.	Topic Name	Text / Reference Book		Course Outcome	Mode of Teaching & ICT Tools
		Chapter No.	Page No.		
UNIT III - ANALYSIS OF ALTERNATIVES- I					
19	Cross-impact analysis	T1-4	186-212	CO3	BB
20	Structural modeling tools-Tree Structures	T1-4	212-220	CO3	BB
21	Structural modeling tools-Casual Loop	T1-4	220-231	CO3	PPT
22	System Dynamics models :Population model,System Dynamics	T1-4	231-262	CO3	**Think-Pair share**
23	System Dynamics models: Workshop Dynamics models	T1-4	262-271	CO3	PPT
24	present value analysis	T1-4	271-278	CO3	PPT
25	Benefits and costs over time	T1-4	278-282	CO3	PPT
26	Effort and schedule	T1-4	282-286	CO3	BB
27	Work and Cost breakdown structure	T1-4	286-288	CO3	PPT

Topic No.	Topic Name	Text / Reference Book		Course Outcome	Mode of Teaching & ICT Tools
		Chapter No.	Page No.		
UNIT IV - ANALYSIS OF ALTERNATIVES–II					
28	Reliability, and Availability, models	T1-4	292-299	CO 4	BB
29	Maintainability, and Supportability models	T1-4	299-307	CO 4	PPT
30	Network Flows	T1-4	307-316	CO 4	BB
31	Stochastic networks	T1-4	316-318	CO 4	BB

32	Markov models	T1-4	318-321	CO 4	PPT
33	Queueing Model and Optimization	T1-4	321-330	CO 4	**Seminar**
34	Time series	T1-4	330-336	CO 4	PPT
35	Regression models	T1-4	336-343	CO 4	BB
36	Evaluation of large scale models	T1-4	343-348	CO 4	PPT